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REPORT OF THE ANNUAL MEETING

PREPARED BY THE HOME SECRETARY

The Annual Meeting of the Academy was held in the Smithsonian Institution in Washington, April 22, 23, and 24, 1918.

Fifty-eight members were present as follows: C. G. Abbot, Ames, Bailey, Becker, Benedict, W. W. Campbell, Carty, F. W. Clarke, J. M. Clarke, Conklin, Crew, Cross, Dall, Davenport, Davis, Donaldson, Fewkes, Flexner, Hale, Halsted, Hillebrand, Howard, Howell, Iddings, Kasner, Lillie, Meltzer, Mendel, T. C. Mendenhall, Merriam, Michelson, Millikan, E. S. Morse, Moulton, E. L. Nichols, E. F. Nichols, A. A. Noyes, W. A. Noyes, H. F. Osborn, Pearl, Pupin, Ransome, Reid, Rosa, Schlesinger, Erwin F. Smith, Stratton, Thomson, Ulrich, Van Hise, Van Vleck, Walcott, Webster, Welch, Wheeler, D. White, Wilson, Woodward.

BUSINESS SESSIONS

The President announced that the Home Secretary, Mr. Arthur L. Day would not be present, owing to absence from the city on matters relating to war.

REPORTS FROM OFFICERS OF THE ACADEMY

The annual report of the President to Congress for 1916 was presented and distributed.

The President presented the following communication from Mr. R. S. Woodward, resigning the chairmanship of the Committee on the Barnard Medal:

April 9, 1918.

The Home Secretary,
DEAR SIR:

Permit me to tender through your office to the Council of the National Academy of Sciences my resignation as Chairman of the Committee on the Barnard Medal. Like our late colleague, Profesor William James, I find that with advancing years it is desirable to relieve oneself of what he fittingly called "life's baggage." Having assisted at the birth of many of our American Societies and served them in one way or another for many years, and having acted as the Chairman of the Committee on the Barnard Medal for a decade, I am disposed to think it will be advantageous for me, for the Academy, and for contemporary society to transfer the duties of the Chairmanship of the Committee in question to a younger man.

Faithfully yours,

ROBERT S. WOODWARD.

MOVED: That the resignation of Mr. Robert S. Woodward as Chairman of the Committee on the Barnard Medal be accepted with regret, that Mr. T. H. Morgan be elected a member of the Committee, and that Mr. A. A. Noyes be elected Chairman. (Adopted.)

The President announced the following changes in the personnel of the Sections and Committees:

Section of Geology and Paleontology: J. M. CLARKE, Chairman.

Section of Botany: ERWIN F. SMITH, Chairman.

Section of Anthropology and Psychology: J. WALTER FEWKES, Acting Chairman.

Local Committee: WHITMAN CROSS, Chairman, DAVID WHITE, FREDERICK L. RANSOME, RAYMOND PEARL, EDWARD O. ULRICH.

Other committee appointments with dates of expiration, were as follows:

Program: E. L. THORNDIKE to serve unexpired term of J. MCKEEN CATTELL 1920.

Henry Draper Fund: GEORGE E. HALE, to succeed himself, 1923.

J. Lawrence Smith Fund: E. S. DANA to succeed himself, 1923.

Comstock Fund: E. L. NICHOLS to succeed himself as member and Chairman ,1923.

Marsh Fund: CHARLES SCHUCHERT to succeed himself, 1921.

Murray Fund: WILLIAM H. DALL to succeed himself as member and Chairman, 1921.

Marcellus Hartley Fund: HENRY F. OSBORN and MICHAEL I. PUPIN to succeed themselves, 1921.

Barnard Medal: A. A. NOYES, Chairman; T. H. MORGAN to succeed R. S. WOODWARD.

The report of the Treasurer was presented in printed form and approved.

The report of the Home Secretary was presented as follows:

April 22, 1918.

The President of the National Academy of Sciences.

SIR: I have the honor to present the following report on the publications and member ship of the National Academy of Sciences for the year ending April 24, 1918.

No Scientific Memoirs have been published during the year, but "The Complete Classification of the Triad Systems in Fifteen Elements," by H. S. White, F. N. Cole and Miss L. D. Cummins, recommended to be published as one of the Memoirs of the National Academy of Sciences, was approved by the Committee on Publication and is now in the hands of the Public Printer. The actual publication may be delayed, owing to war conditions.

Of the Biographical Memoirs, that of John Shaw Billings, by S. Wier Mitchell, with the Scientific Work of John Shaw Billings, by Fielding H. Garrison; and William Stimpson, by Alfred G. Mayer, have been published. The former has been distributed, while that of Stimpson has just come from the printer. The manuscript of the Biographical Memoir of James Wright Dana, by L. V. Pirsson, Cleveland Abbe, by W. J. Humphreys, and William Bullock Clark, by John M. Clarke, are in the hands of the Committee on Printing; that of Benjamin O. Peirce, by Edwin H. Hall, is now in galley proof.

The Annual Report for 1917 has been published and is ready for distribution. The Proceedings of the Academy have been published regularly and have reached the third number of the fourth volume.

Four members have died since the last meeting. William Bullock Clark, elected in 1908, died July 27, 1917; James M. Crafts, elected in 1872, died June 21, 1917; Arnold Hague, elected in 1885, died May 15, 1917; Franklin Paine Mall, elected in 1907, died November 17, 1917, and one foreign associate, Adolf von Baeyer, died in August, 1917.

Fifteen new members were elected in April, 1917, making 157 active members on the present membership list; one honorary member and 36 foreign associates.

ARTHUR L. DAY, *Home Secretary.*

REPORTS FROM COMMITTEES ON TRUST FUNDS

A report was received from the Directors of the Bache Fund, signed by Edwin B. Frost (Chairman), stating that since the annual meeting of the Academy in April, 1917, grants Nos. 205–209 (as announced in the PROCEEDINGS, p. 273, below) had been made; and that reports on these and previous grants had been received as follows:

No. 193, C. A. KOFOID, University of California, for assistance in securing animals in the Indian jungle and in their preparation for study in research on the intestinal protozoa. Mr. Kofoid is serving as Major in the Sanitary Corps and the work is being continued by research assistants on the material collected during Mr. Kofoid's travels.

No. 202, W. C. ALLEE, Lake Forest College, Illinois. Research concluded on 'The salt content of natural waters in relation to rhectaxis in Asellus," *Biol. Bull., Woods Hole,* **32,** 93–971. Preliminary results on first phases of investigation concerning a possible correlation between CO_2 production and phototaxis are completed and are in the hands of the editors of *J. Exp. Zool., Philadelphia.* Research is in progress concerning the cause of formation of aggregations of may-fly nymphs and other reactions, and to CO_2 production. Also effect of molting on both above factors; also as to effect of the cyanides on respiration and reactions to various stimuli.

No. 203, J. P. IDDINGS, Brinklow, Maryland. The chemical analysis of igneous rocks collected in Asia and Australasia is completed and the results published in the PROCEEDINGS of this Academy. The work with the microscope and thin sections will continue for some years to come.

No. 204, IRVING W. BAILEY, Bussey Institution, Harvard University, for field data for a study of environment upon the anatomical structure of angiosperms. Cancelled and the money returned to the Treasurer because it was found impracticable for Professor Bailey to go to Guatemala under present war conditions.

No. 205, T. H. GOODSPEED, University of California. Between 20,000 and 25,000 measurements in the flower-size investigations on Nicotiana were made duringt he summer and fall of 1917. These experiments are to be concluded during the summer and results published thereafter.

No. 206, REGINALD A. DALY, Harvard University. The deep sea thermograph has been completed and a description has been published by its designer, Mr. Harry A. Clark, in *Bull. Mus. Comp. Zool., Harvard College,* **61,** No. 15.

No. 209, CECIL K. DRINKER, Harvard Medical School. Research still in progress. A paper, entitled "The factors concerned in the appearance of nucleated red blood corpuscles in the peripheral blood. II. Influence of procedures designed to increase the rate of blood flow through the blood-forming organs—hemorrhage and infusion," by Cecil K. Drinker Katharine R. Drinker and Henry A. Kreutzmann, was published in *J. Exp. Med.,* **27,** 383–397, 1918.

The Directors have voted to transfer to capital account the sum of $2,575, which has been carried for a number of years as 'invested income,' together with $425 of current income, so that the principal of the fund now stands at $59,000.

An effort is being made to pay the American collaborators of the 'Nomenclator Animalium Generum et Subgenerum' the amounts due them for their work. A grant of $1,000 was made in 1913 to Professor F. E. Schulze, of Berlin, specifically for assistance by American men of science in this undertaking It now seems probable that these men can soon receive their compensation. After providing for this liability of $1,000, the cash on hand available for grants. on April 15, 1918, is $10.81.

A report was received from the Trustees of the Watson Fund, signed by A. O. Leuschner (Chairman), W. L. Elkins, and G. C. Comstock, stating that grants Nos. 16–17 (as announced below, p. 273) were recommended. Reports on previous grants were as follows:

No. 14, John A. Miller, Sproul Observatory, Swarthmore College, is expending his appropriation for the services of an assistant in parallax determinations. A list of 50 parallaxes, together with a list of observations and reductions, has been published. A second list of 50 should be ready before the beginning of January, 1919.

No. 15, Herbert C. Wilson, Goodsell Observatory, Northfield, Minn., is expending the appropriation for the services of an assistant in measuring and reducing photographic plates of asteroids for position and magnitude. The measurement and reduction of 97 plates has been completed. For 71, the results are published in *Pub. Goodsell Obs., Northfield, Minn.*, No. 5. Of the 26 unpublished measures, 15 are of plates of seven Watson Asteroids. A highly satisfactory color screen suitable for the 16-inch telescope has been made by R. J. Wallace, Research Laboratories of the Cramer Dry Plate Company.

A report was received from the Committee on the Henry Draper Fund, signed by W. W. Campbell (Chairman), as follows:

No awards have been made in the past year: the reduced size of many observatory and laboratory staffs, because of war activities, has not permitted normal development of new methods in astrophysics, and there have been no urgent calls for special instruments.

A grant of $500 made to W. W. Campbell two years ago, to provide the mounting of an ultra-violet spectrograph for use with the Crossley reflecting telescope, was expended, and the finished instrument was described in *Lick. Obs. Bull., Berkeley*, No. 291, in May, 1917. This instrument has been used by Mr. Wright in photographing the spectra of all the brighter planetary nebulae in the northern two-thirds of the sky.

A grant of $300 made in April, 1917, to Professor Joel Stebbins, of the University of Illinois, and a similar grant in like amount made earlier, are being applied, in accordance with agreement, in payment of part-time salary of an assistant to Dr. Stebbins in order to further the latter's development of the photo-electric cell photometer and the application to the study of variable stars. Quoting from Professor Stebbins' report dated April, 1918: "The photo-electric photometer has been improved until it is now from ten to twenty times as sensitive as the selenium photometer. We can measure the brightness of stars three magnitudes fainter than those which it was possible to observe with the selenium instrument. About a dozen new bright variable stars have been discovered, of which eight have been announced at meetings of the American Astronomical Society. We are also carrying on studies of several known variables." In further agreement with the terms of the grant, the University of Illinois has arranged to continue the assistant on full time in Professor Stebbins's department after the close of the present academic year.

A report was received from the Committee on the J. Lawrence Smith Fund, signed by E. W. Morley (Chairman), stating that the Fund now has a cash balance of income of $1188.85 and a balance of invested income amounting to $1532.50, recommending grants No. 9 (as announced below, p. 274), and containing the following reports on previous grants:

No. 3, Edmund O. Hovey, American Museum of Natural History, New York, received in 1909 a grant of $400 to aid in the study of certain meteorites. The pressure of adminstrative duties has been so severe that the investigation is suspended, at least for a time, and Dr. Hovey proposed to return the grant. The Committee hesitated, but at last accepted the proposal, and the amount of the grant, together with interest, has been repaid, to the Treasurer of the Academy.

No. 4, C. C. TROWBRIDGE, Columbia University, New York, has received from 1909 to 1917, grants amounting to $1400 to aid in the study of meteor trains. The work of the last year has consisted of the further collection of illustrations of meteor trains and the study of spectrum observations. No further grant is sought. A letter from the recipient follows.

Dear Professor Morley:

I beg to submit herewith a brief report relative to the grant made to me from the J. Lawrence Smith Fund for aid in work on the atmosphere of the earth and on the trains of meteors.

The progress for the year 1917 has been as follows: Work has been continued on the collection of illustrations of meteor trains; on the study of meteor train theories, and study of the spectrum observations.

It has been shown that there is good reason to believe that the spectra of trains observed indicate a gas phosphorescence similar to that of 'active' nitrogen (nitrogen in the phosphorescent state) rather than the light from hot metals as believed by the various observers. Further observations of importance have been made on the auroral features of the meteor train zone. This phase of the investigation is bound up with meteor train study for the following reasons:

The meteor train zone and the main aurora are the same; the potential gradient across this zone is probably the cause of the visual effects in both cases. The drift of the atmosphere as shown by drifting trains in the meteor train zone unquestionably has an important bearing on the electric discharges which cause the auroral glow.

Financial Statement

Total funds received to December 31, 1916	$1,153.50
Total expenditures to December 31, 1916	1,020.67
Balance, December 31, 1916	$132.83
(as per financial statement submitted March 26, 1917)	
Received from Treas., Nat. Acad. Sciences, March 22, 1917	250.00
Total	$382.83

Expenditures in 1917

January		M. M. King, typewriting	$2.40
February		Science reprints	8.00
March		Exchange on Washington check	.10
March	12	Geo. Merritt, Jr., asst. 23 hours	13.80
April	2	J. Boldtman, photographer	1.50
April	2	Bureau of Supplies, Columbia Univ.	1.20
April	30	J. Boldtman, photographer	3.40
May	1	Geo. Merritt, Jr., assistant	19.60
May	10	Bur. of Supplies, Columbia Univ.	1.60
June	1	Amy E. Davis, assistant	36.00
June	15	Mabel Weil, assistant	62.70
June	18	Printing, New Era Printing Co.	5.89
			$156.19

Cash on hand, December 31, 1917

Balance in Corn Exchange Bank	$149.90
Cash	1.45
Balance in Washington Savings Bank	75.29
	$226.64

Condensed Statement

Total funds received		$1,403.50
Total expenditures to December 31, 1917	$1,176.86	
Balance	226.64	1,403.50

Respectfully yours,

C. C. Trowbridge.

No. 6, S. A. Mitchell, University of Virginia, University, Virginia, received in 1915 a grant of $500 to aid in securing observations of paths and radiants of meteors, and in computing orbits when the observations are sufficient; further grants of $300 were made in 1916 and 1917. The war lessened the number of observations secured, during 1917, but this lessened number amounted to 4,231, making the whole number of observations about 19,000. An abstract of results for 1917 has been published by Dr. Olivier in a recent number of *Popular Astronomy*.

No. 7, George P. Merrill, United States National Museum, received last November a grant of $400 to aid in further study of certain elements in meteorites. Of this grant he has spent $185, and there remains to his credit $215.

A report was received from the Directors of the Wolcott Gibbs Fund, signed by C. L. Jackson (Chairman), stating that during the past year no application was received for a grant from the Fund, and owing to the disorganization of chemical research by the war, it was not thought worth while to try to get applications; that the unexpended income of the Fund amounts to $360.87; and that holders of grants have reported as follows:

Nos. 2 and 5, M. E. Holmes, of Connecticut College, finds that the exacting duties of her new position will prevent her from continuing her research, and has returned the unexpended balance of the two grants amounting to $86.32.

No. 6, G. P. Baxter, Harvard University, has spent $194.31 for material and apparatus since the last report. No platinum was bought, as the war had rendered it too expensive. The three researches described in the last report have been finished, and accounts of the results will be published soon. These were (*a*) Electrolytic Deposition in a Mercury Cathode, and the Atomic Weight of Cadmium, with C. H. Wilson. A slight loss was discovered, and corrected experimentally, after which eight determinations gave the atomic weight of cadmium as 112.40. (*b*) Impurities in Silver and Iodine, with L. W. Parsons. In 1 gram of the silver used for atomic weight determinations 0.004 mgm. of gas were found; in the iodine, 0.002 mgm. of gas. Most exacting spectroscopic tests showed no impurities in the silver. These results dispose of the criticisms of P. A. Guye on the Harvard atomic weight determinations. (*c*) The ratio of Arsenic Trioxide to Iodine, with L. A. Youtz. The atomic weight, 74.96, was found for arsenic. In addition a fourth research has been started. (*d*) The Atomic Weight of Mercury, with Matsusuke Kobayashi. All these researches but the last have been stopped by the enlistment of the graduate students in war service.

Nos. 4 and 7, W. D. Harkins, University of Chicago, has bought a vacuum pump for $55.00, and is about to buy one still more efficient. He has studied the "Secondary Valence and Werner's Co-ordination Number from the Standpoint of the Ammines of Cobalt" with G. L. Clark. The existence of the salt $CoCl_2IONH_3$ has been established; and the phenomena observed in the formation of this compound have been studied, and some of its physical constants. The work was broken off by the enlistment of Mr. Clark in the service of the Government before it could be brought to an end. It will be continued as soon as possible, as it promises to show either that Werner's constitution of the cobaltammines is incorrect, or that his co-ordination number must be changed from 6 to 10. Other results of great interest are also indicated.

No. 8, R. L. Datta, Presidency College, Calcutta, has sent orders for organic chemicals amounting to £20, but has received none because of the war.

A report was received from the Committee on the Marsh Fund, signed by E. H. Moore, Chairman, recommending grant No. 2 (as announced below, p. 274) and containing the following statement:

No. 1, J. M. Clarke, State Museum, Albany, reports progress in the assembling of material for his study of mutualism, symbiosis, and dependent life among animals.

A report was received from the Committee on the Murray Fund, signed by Wm. H. Dall, Chairman, as follows:

On November 1, the sum to the credit of the Murray Fund was $569.61. The Treasurer suggested and as Chairman I approved of the investment of the major part of this sum in Liberty bonds, which (should the Council decide to offer the medal this year) could readily be turned into cash. . . . .

A report was received from the Committee on the Comstock Fund, signed by Edw. L. Nichols, Chairman, as follows:

Five years having nearly elapsed since the first award of the Comstock prize to Professor (now Lieutenant Colonel) R. A. Millikan, the committee met in Philadelphia at the time of the November (1917) sessions of the Academy, four members being present. After careful consideration of various suggestions previously made in writing at the request of the chairman, the committee unanimously recommended that the second award of the Comstock Prize be made by the Academy to Samuel Jackson Barnett, Professor of Physics at Ohio State University, for his investigations on Magnetization by Rotation.

In this research the following fundamental and very important facts were established:

(1) that there are within the iron currents of negative electricity in orbital revolution,

(2) that these gyrostatic systems have inertia and are capable of definite orientation or arrangement by the rotation of the body without the action of any external magnetic field,

(3) that such orientation manifests itself as a magnetization of the body as a whole.

The committee further recommended that as in the case of the first award, the value of the prize be $1,500.00.

The President presented recommendations from the Committees on the Henry Draper Medal and the Daniel Giraud Elliot Medal and Honorarium for the following awards which were approved by the Academy:

American Museum of Natural History,
New York, February 7, 1918.

My dear Mr. Day:

Thanking you for your letter of February sixth and the return of my letter of January ninth, as Chairman of the Committee on the award of the Daniel Giraud Elliot Gold Medal, I believe that the committee will agree that Dr. Frank M. Chapman, of the American Museum of Natural History, in view of his memoir, "The Distribution of Bird-life in Colombia, a contribution to a biological survey of South America," *Bulletin of the American Museum of Natural History*, Volume XXXVI, 1917, pages 7–10 (Roman), 1–729 (Arabic), is entitled to first consideration and premiership for the year 1917, as having produced the most earnest single work in zoölogy, the result of six years serious exploration and research, namely, from December, 1910, until the publication of the volume in December, 1917.

As chairman of the committee, I respectfully submit this as a substitute report, with the approval of my colleagues.

Fortunately, Doctor Chapman is one of the most distinguished of the many followers of Dr. Joel Asaph Allen, and he was also closely associated with Dr. Daniel Giraud Elliot; consequently I trust the Committee will regard the award of the medal as eminently appropriate.

Respectfully submitted,

HENRY FAIRFIELD OSBORN, *Chairman.*

Mount Hamilton, January 19, 1918.

Dear Dr. Day:

I have just sent you the following night letter:

> "I herewith certify nomination of Walter S. Adams, Mount Wilson Observatory, for his investigations in astrophysics, by Draper Committee for award of Draper Gold Medal. I hope Council can make award practicable at this year's meeting."

Dr. Walter Sidney Adams has discovered and developed a method of determining the distances of the stars, by means of the spectrograph, which the Henry Draper Committee believes is one of the great advances in modern Astronomy. Like most methods of high value, its fundamentals are exceedingly simple. The basic fact is that certain lines are enhanced in the spectra of stars of high absolute luminosity, and certain other lines are enhanced in the spectra of stars of low absolute luminosity; in other words, the intensities of certain lines increase continuously with increasing absolute luminosities, and the intensities of certain other linds increase continuously with decreasing absolute luminosities. The approximate distances of a few hundred of the nearer stars, measured by the older methods, are known. These distances enable us to compute the absolute magnitudes or luminosities of those stars. The correlation of these absolute magnitudes and the estimated relative intensities of the critical lines in their spectra have given Mr. Adams the power to determine the functional relations connecting these elements, and thus to determine the absolute magnitudes of stars not yet observed for distance. Knowing the magnitude of a star as observed from the earth, and the absolute magnitude of the same star as determined by the spectrograph, the solution of a simple equation yields at once the value of the star's distance. Here is a powerful means of extending the list of stars whose distances are known, and the Committee confidently expects that the method will be applied successfully to thousands of stars which are too distant for successful attack by the earlier methods. The method should in due time tell us much concerning the linear scale of the nearer parts of our stellar system. The secondary applications of the method to astronomical problems are likewise of great promise.

Mr. Adams has applied the spectrographic method to the determination of the distances of more than five hundred stars, of the Harvard spectral classes F to Mb inclusive, and a comparison of his results with those obtained by the older methods, as to rapidity and accuracy, is a subject for congratulation.

The method has not yet been applied satisfactorily to stars of certain spectral classes, but it is hoped that the dependence of such spectra upon absolute luminosities or other elements may be found in the near future.

Dr. Adams's contributions to other lines of astronomical research have been many, extensive and fruitful. We mention three:

The spectrographic determination of the sun's rotational speeds by comparing the motions of approach of the eastern limb and the motions of recession of the western limb with the apparent motions of approach or recession of points on the solar meridian passing through the earth. The results form a monumental contribution to the complicated and still unsolved problem of the solar rotation.

His long exposures on the spectra of the present-day faint remnants of new stars formerly brilliant have shown that these stars are now of the Wolf-Rayet type.

The more thorough application of high dispersion spectroscopy to the study of the sun's chromosphere. Prior to the establishment of the Mount Wilson Solar Observatory, this was essentially a total solar eclipse problem. Stratification of the chromosphere has been studied by Adams without an eclipse at least as successfully as it had formerly been studied at times of total solar eclipse.

Respectfully submitted,
W. W. CAMPBELL, *Chairman.*

GENERAL BUSINESS

The following report from the Editorial Board of the PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES was presented by the Chairman, Raymond Pearl:

1. Three volumes of the PROCEEDINGS have been completed, and four numbers of the fourth volume have been issued.

The statistics as to the make-up of the third volume, both in respect of subject matter and of source of the contributions, have been printed in the Annual Report of the Academy for 1917, and need not now be repeated except so far as covers one point.

The statistics of articles by members of the Academy as compared with articles by non-members are interesting mainly in showing a progressive diminution in the percentage of articles by members, despite the increase in membership of the Academy. If there are obstacles which can be removed and which hinder members of the Academy from printing in the PROCEEDINGS, would it not be well to make efforts to remove them? The Academy represents the highest point in American research, and if the PROCEEDINGS should actually contain articles representing the totality of the investigations of members of the Academy it would become thereby largely representative of all American research and of very high grade, and furthermore it would be more truly the Proceedings of the Academy in the sense that corresponding publications of foreign academies are representative of their research.

2. At the Autumn meeting the terms of office of five members of the Editorial Board expired, and new appointments were made by the Council as follows: Jacques Loeb, W. M. Wheeler, E. B. Frost, E. L. Thorndike, and E. H. Moore.

3. At the Autumn meeting the Board decided to put into operation certain changes in the typographical make-up of the PROCEEDINGS in the interest of economy. These changes have been made with satisfactory results.

4. The Editorial Board is of the opinion that in view of the now established and recognized position of the PROCEEDINGS as a medium of scientific publication, the members of the Academy might well contribute more of their own papers to its pages than they now do, both from the standpoint of self-interest as well as from a sense of duty to the Academy and what it stands for. In this connection the Board would recommend that the Academy adopt as a general principle the policy of requiring each recipient of a grant for research from any of its special funds to publish some account of the results of the researches under the grant in the PROCEEDINGS.

5. If the above recommendation is adopted, the Board would further recommend that the Academy suggest to the several committees having in charge trust funds from which grants are made that whenever accounts of researches under grants are published in the PROCEED-

INGS there shall be paid over from the Trust Funds out of which the grants are made, to the PROCEEDINGS account, if such action be permissible under the terms of the bequest, a sum of money to cover the expense of the publication at a rate of $6.00 per printed page.

Anent the above report the following recommendations were submitted from the Council and adopted·

That the following recommendations from the Editorial Board of the PROCEEDINGS be approved by the Academy and that the Home Secretary be instructed to bring these recomdations to the attention of the members of the Academy and the chairmen of the trust funds.

That members of the Academy be requested to contribute their own papers to the PROCEEDINGS.

That the policy of requiring each recipient of a grant for any research from any of the special funds to publish an account of the results of the researches under the grant in the PROCEEDINGS be approved.

That the Academy request the committees and trustees of the several trust funds of the Academy from which grants are made that whenever accounts of researches under grants are published in the PROCEEDINGS there shall be paid over from the Trust Fund out of which the grants are made, to the PROCEEDINGS account, if such action is permissible under the terms of the bequest, a sum of money to cover the expense of the publication.

A report was received from the Finance Committee of the PROCEEDINGS, signed by C. B. Davenport, Chairman, F. R. Lillie, and Raymond Pearl, as follows:

The estimated net cost of the PROCEEDINGS for 1918 is $5,600.00.

The estimated income is as follows:

From subscriptions (provided each member of the Academy becomes responsible for one subscription)	$1,800.00
One-third guarantee fund of $2,500	833.00
Estimated income of Billings Fund	187.00
Sundry other income (members dues, $850, N.R.C., $400, Dr. Walcott, special, $100)	1,350.00
Total estimated income	$4,170.00
Total estimated deficit	$1,430.00

If recommendation of the Editorial Board that space for reports of special grants in PROCEEDINGS be specially paid for be adopted, this deficit will be reduced to $1,200.00.

The Committee plans to raise funds to meet this deficit.

A report was received from the Auditing Committee, signed by C. G. Abbot, Chairman, W. F. Durand, and A. L. Day, certifying the accuracy of the Treasurer's books.

The Chairman of the Research Council, Mr. Hale, presented a verbal report in which he called attention to the printed report of the Research Council which had appeared in the Annual Report of the National Academy of Sciences.

The following amendment to the Constitution was presented from the Committee of the Whole and adopted:

That the constitution be amended by substituting in Article II, Section 1, line 3 (Report, 1916) the word *four* for the word *six* so that it will read for a term of four years . . . .

to take effect on the expiration of the term of office of the present incumbents or in case of a vacancy.

Article II, Section 1, when amended to read:

SECTION 1. The officers of the academy shall be a president, a vice president, a foreign secretary, a home secretary, and a treasurer, all of whom shall be elected for a term of four years, by a majority of votes present, at the first stated meeting after the expiration of the current terms, provided that existing officers retain their places until their successors are elected. In case of a vacancy, the election for four years shall be held in the same manner at the meeting when such vacancy occurs, or at the next stated meeting thereafter, as the academy may direct. A vacancy in the office of treasurer or home secretary may, however, be filled by appointment of the president of the academy until the next stated meeting of the academy.

The President, in closing, gave the present status of the aeronautical work that is being carried on by the Academy for the country.

ELECTION OF OFFICERS AND MEMBERS

Two Members of the Council.—W. H. HOWELL to succeed himself, term expiring in 1921; C. G. ABBOT to succeed John M. Coulter, term expiring in 1921.

The following persons were elected as new members of the Academy.

ROBERT GRANT AITKEN, Astronomer, Lick Observatory, California.
GEORGE FRANCIS ATKINSON, Botanist, Cornell University, Ithaca, New York.
GEORGE DAVID BIRKHOFF, Mathematician, Harvard University, Cambridge, Mass.
PERCY WILLIAMS BRIDGMAN, Physicist, Harvard University, Cambridge, Mass.
STEPHEN ALFRED FORBES, Zoölogist, Urbana, Illinois.
JOHN RIPLEY FREEMAN, Engineer, Providence, Rhode Island.
CHARLES JUDSON HERRICK, Neurologist, University of Chicago, Chicago, Illinois.
LUDVIG HEKTOEN, Pathologist, University of Chicago, Chicago, Illinois.
FRANK BALDWIN JEWETT, Engineer, Western Electric Company, New York, New York.
WALTER JONES, Physiologist, Johns Hopkins University, Baltimore, Maryland.
IRVING LANGMUIR, Chemist, General Electric Company, Schenectady, New York.
CHARLES ELWOOD MENDENHALL, Physicist, University of Wisconsin, Madison, Wisconsin.
JOHN CAMPBELL MERRIAM, Paleontologist, University of California, Berkeley, California.
HENRY NORRIS RUSSELL, Astronomer, Princeton University. Princeton, New Jersey.
DAVID WATSON TAYLOR, Engineer, Admiral and Chief of the Bureau of Construction and Repair, United States Navy.

SCIENTIFIC SESSIONS

Two public lectures on the WILLIAM ELLERY HALE Foundation were given on April 22 and 23 by JOHN C. MERRIAM, of the University of California, on the Beginnings of Human History from the Geologic Record.

Four public scientific sessions were held on April 22 and 23 at which the following papers were presented:

FRANCIS G. BENEDICT: The effects of a prolonged reduced diet on twenty-five college men: I. On basal metabolism and nitrogen excretion.

WALTER R. MILES (introduced by F. G. Benedict): The effects of a prolonged reduced diet on twenty-five college men: II. On neuromuscular processes and mental condition (illustrated).

H. Monmouth Smith (introduced by F. G. Benedict): The effects of a prolonged reduced diet on twenty-five college men: III. On efficiency during muscular work and general muscular condition (motion pictures).

W. S. Halsted: The partial occlusion of great arteries in man and animals (illustrated).

S. J. Meltzer: Three papers (illustrated). (*a*) The favorable effect of subcutaneous injection of magnesium sulphate in tetanus. (*b*) The possible danger of intravenous injection of magnesium sulphate. (*c*) The antagonistic and curative action of calcium salts in these cases.

Henry Fairfield Osborn: The Liberty field hospital ward. Designed on the unit construction plan. Portable. Adapted to American overseas summer and winter service (motion pictures).

Simon Flexner: The war and medical research (illustrated).

Edward Kasner: Conformal geometry.

S. J. Barnett (by invitation. Comstock prize recipient): Magnetism by rotation.

A. A. Michelson: On the correction of optical surfaces.

W. W. Campbell: Some recent observations of the brighter nebulae (illustrated).

R. A. Millikan: Physical researches for the war.

F. W. Clarke: Notes on isotopic lead.

Lawrence J. Henderson (introduced by Raymond Pearl): The physico-chemical properties of gluten.

Thomas Wayland Vaughan (introduced by David White): Correlation of the tertiary formations of the southeastern United States, Central America and the West Indies.

W. M. Davis: Coast survey charts and fringing reefs of the Philippine Islands (illustrated).

Henry Fairfield Osborn and William K. Gregory: Recent researches on the skeletal adaptations and modes of locomotion of the Sauropod Dinosaurs (illustrated).

Charles D. Walcott: Some additional data on the Cambrian Trilobites (illustrated).

C. R. Van Hise: The development of Governmental regulations during the world war.

C. Hart Merriam: The big bears of North America.

G. H. Parker: The growth of the Pribilof fur-seal herd between 1912 and 1917 (illustrated).

Henry H. Donaldson: A comparison of the growth changes in the nervous system of the rat with the corresponding changes in man (illustrated).

Robert M. Yerkes (by invitation): Measuring the mental strength of an army (illustrated).

Arthur Gordon Webster: Some considerations on the exterior ballistics of a gun of 75 miles range.

J. P. Iddings: Biographical memoir of the late Arnold Hague.

C. G. Abbot: Perodicity in the variation of the sun.

John M. Clarke: Biographical memoir of the late William Bullock Clark.

Edwin H. Hall: Ionization in solid metals.

E. L. Nichols and H. L. Howes: On the types of decay of phosphorescence.